

6 November 1959

Dear Dick:

I would like to discuss further some of the items on the agenda for our 2 November meeting, including some thoughts that have occurred to me since that time. I do not know if John or Gene recorded the agreements reached during this period; so I would like to start this very lengthy epistle with a summary of some of the things I think we agreed to, without going into any lengthy technical discussion.

Referring to the basic meeting agenda, I think these comments apply:

- 1A. We agreed that the basic schedule attached to my October Progress Report was acceptable, including the schedule of engine deliveries. I am not sure that I attached a copy of the production schedule deliveries, including specific dates, to our progress report; so it is appended hereto.
- 1B. All aircraft will be built utilizing the A.R. materials, but initial flights, on the first airplane at least, would incorporate all-metal "falsies."
- 1C. We agreed to the necessity for defining the major elements and particularly the aerodynamic configuration by 1 January 1960. Variations, however, in the non-metallic parts can be expected through the whole year of 1960, as a result of tests which will be going forward.
- 1D. I believe our reporting procedures are clear. There will be the monthly progress reports, of which you have received the September and October copies. The additional test reporting and interchange of information with [REDACTED] will be as per your wire [REDACTED] 3570. 25X1A2g Sterile phones have now been installed in my office. The number is [REDACTED]. We expect you will implement the commo center shortly. I do not believe any other reports were called for, except as we complete various tests in the tunnel or on structures. These will be reported as in our past practice, similar to the titanium reports with which you have been furnished.
- 1E. The various payloads were discussed, and I think you approved our basic proposal for providing an equipment bay which can be used either pressurized or non-pressurized. I think we should raise the payload at this time to an official 800 pounds, but no higher.

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Between you and me, personally, the airplane will be structurally capable of handling more.

- IIA. After discussing the A.R. test results to date, we considered future test schedules. I am very perturbed that the completion of the new site will be delayed at least two weeks beyond our original plans. In any case, we will be ready with our test models, and I am including a preliminary test outline which we are putting in optimum form in order to make minimum model changes to get the final test configuration. While the order of testing as shown on this outline may be changed, the basic tests are outlined therein. We went over this with Frank before he left, and he has a copy of it. When we get our feet on the ground at the [REDACTED] I think it would be advisable to improve the test technique along the lines outlined in the attached memo from [REDACTED] I think [REDACTED] already agrees with some of these suggestions, and a few dollars spent on a little added equipment will pay off handsomely in a higher rate of testing and better test data. I think, also, that we should be keeping in mind the adaptation of some of the equipment and radar sets at the [REDACTED] for evaluation of the flying aircraft down the road. It certainly makes a lot of sense to do our eventual flight testing against equipment installed at the same site.
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- IIB. We are set up to make continuous wind tunnel tests through 1960 but have not yet arranged for time in the Langley Tunnel to evaluate over-all temperature distribution. This should be done on the final model configuration, probably in February or March, and it is a little too early to ask for arrangements for tunnel facilities.
- IIC. We all agreed that the problem of the afterburner-augmentor configuration, from an A.R. point of view, should get the highest possible priority in our investigations and thoughts. A visit to [REDACTED] is planned for some of our group on 9 and 10 November, and test models for the 1/8 scale A.R. bag model will be evaluated as early in the test program as possible. As soon as LAC engineering personnel are available to put on the problem (within the next two weeks), we will investigate installation of an F-94C aircraft on the large pole for radar tests on an afterburning cone.
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- IID. The design criteria were reviewed and, I believe, are acceptable to you. You have copies of our memo on the design philosophy which we are following to optimize the design with a minimum

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penalty for M=3.2 and with the optimum capability of going to M=3.5. The design ram temperature for the full adiabatic rise is 793°F at 3.2 and 167° higher at 3.5. Gust maneuver data were covered in a meeting with Gene on 3 November. In general, bomber load factors and the U-2 type of gust distribution at altitude are being considered. I was very much impressed by the information presented by [REDACTED] and [REDACTED] on the afternoon of 3 November, and in a letter next week I will outline some thoughts on steps to be taken to assure our proper consideration of possible adverse weather conditions at high latitudes.

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II E. The special materials were reviewed and I believe we are taking action satisfactory to you in our research. This includes Item IIF on the titanium alloy. A meeting is planned for 9 o'clock Tuesday, 10 November, in the [REDACTED] in Pittsburgh with the [REDACTED] people to discuss their supply of the material. I have contacted [REDACTED] to be sure we get proper security clearance for those to whom we intend to talk. This is a case, of course, where no knowledge of the mission or actual design features of the aircraft will be involved, but it will be necessary to talk of material requirements and operating temperatures.

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II G. Camera design limits were reviewed. I believe we are considering rather unattainable values of accuracy in measuring V/H. My feeling in this regard is augmented by the discussions with [REDACTED]. I feel we will be lucky to come within 3 to 5% for this design criteria and would rarely obtain 1-1/2%. We did not discuss this, but I feel that we should design, or rather have an instrument company design, an altimeter with substantially larger bellows to provide us with information on pressure altitude. We are certain that even the flight test instruments used in the U-2 will be totally inadequate for our pressure altitude measurement on this project.

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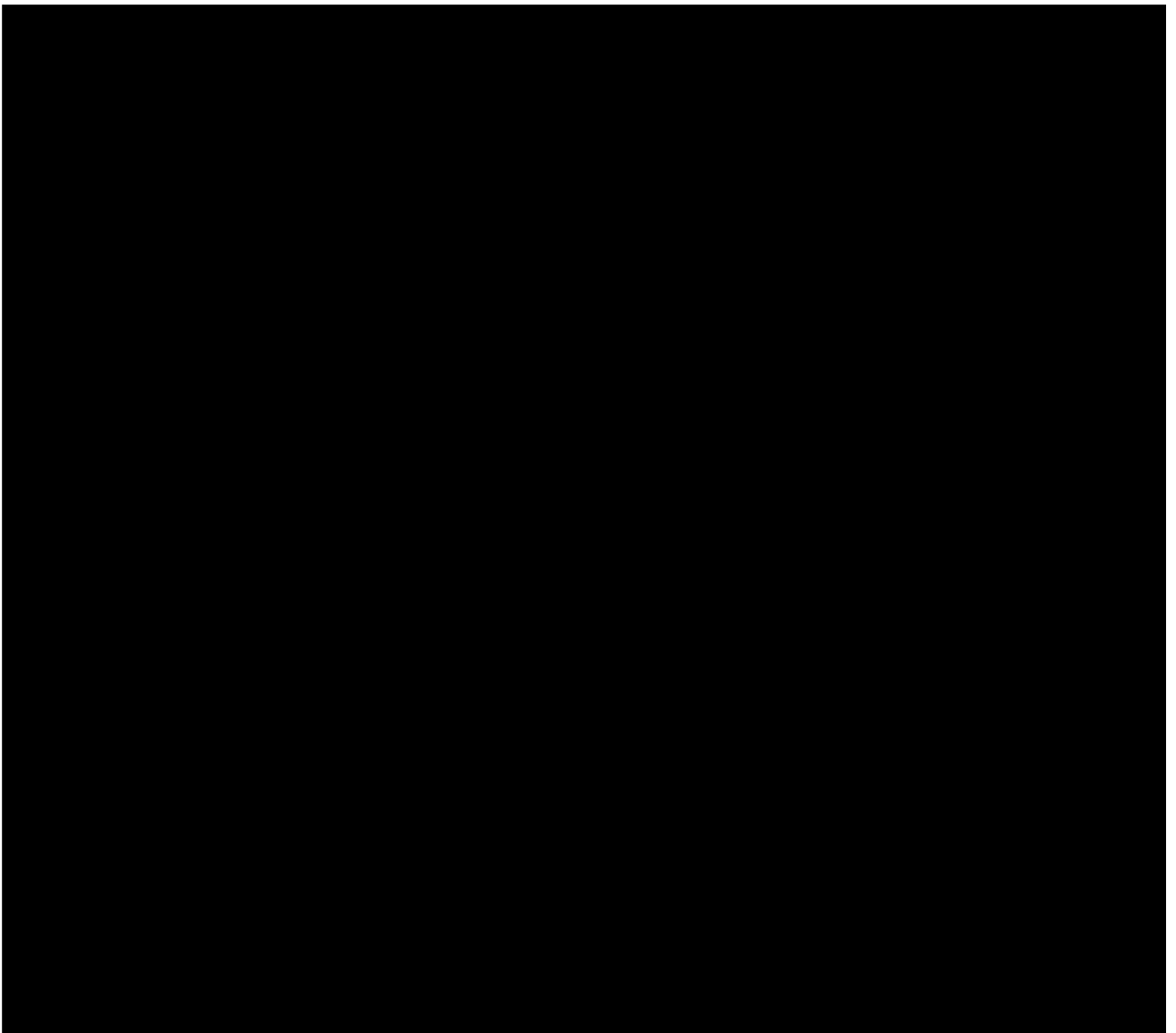
III H. I believe we are all agreed on the conditions of pilot environment and escape. These were reviewed with Gen. Flickinger, have his concurrence, and are reported in report SP-135, copies of which were given to you. We will capitalize to a very large degree on intensive testing going forward on the C-2 set for the F-104 and X-15 pressure suit. I do feel, however, that the survival kit itself should be completely reviewed and redesigned, in light of the missions considered.

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II-I The special fuels status was reviewed, and I think we were all discouraged with the report presented by [REDACTED] I do think we should evaluate the fuel samples we will get from him, but shift our thinking at this point to our alternate fuel -- RJ-1.

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IIJ [REDACTED] have been given the design requirements for the inlet control and we await their bid in terms of an engineering proposal, cost and delivery for this element. It was not feasible to have competitive bidding on this subject, as [REDACTED] make the basic engine control and have the information required to fit the inlet control to the engine. 25X1A5a2



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- 25X1A5a2 IIIB. In the meeting of 3 November, it was agreed with John and [REDACTED] 25X1A5a2 [REDACTED] that we should have the same procedures in getting or not getting competitive bids on small items that we used on the U-2. I posed the problem, however, of the very expensive systems, such as inertial guidance, autopilot, and air conditioning, as examples of items where there are several very competent groups in the field and competitive bidding might be desirable from every point of view except security. LAC will not contact anyone in these fields until you direct us what procedures should be followed and whether you consider competitive bidding to be worth the security problems which will develop. We need an early decision on this matter.
- IIIC. Covered above.
- IIID. I propose that LAC follow the same procedures with regard to capital assets as were undertaken in the U-2 program; that is, we furnish the normal capital on those items which have general use in our particular field. Special items of equipment usable only on the A-12, such as A.R. test instrumentation, would be submitted to you for contractual negotiation. I do not know of any important pending items. The pole facility at the [REDACTED] was one 25X1A6a and some of the items mentioned in [REDACTED] memo to me should legitimately come in this category. 25X1A5a2
- IIIE. The basic airplane breakdown and method of transportation by road was discussed and approved. The transportation is really inflexible, due to various state laws, and approval must be granted a number of weeks in advance before taking the article over the road.

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25X1A1a IIIF. We have put our DC-3 into service to the [REDACTED] on a non-scheduled basis. While I have mentioned to John a transportation cost of [REDACTED] per flight hour for this service, we have not had formal approval, which I now request for this operation. We can provide this service to 15 January or 30 January 1960, but beyond that period we should have another form of transportation. I would recommend your bailing a C-130B to the project for this, the operation to be by LAC, or an equivalent type of operation which would allow us really high speed transportation of not only personnel but large equipment items and aircraft model parts. This item was not settled conclusively during our meeting on the 2nd and 3rd of November.

IIIG. The runway requirements, including an 8,000 foot paved takeoff area, were discussed. The use of concrete for turn-around at the south end of the runway, for the transition onto the lake, and for about 1,000 feet where the airplane will rotate was suggested, without repavement of the complete runway. This problem was not completely decided but will require further evaluation.

IIIH. The personnel requirement and housing were discussed. A maximum of 300 people living at the base was set. LAC will evaluate its manpower requirements against time and submit them at the next suppliers' meeting for discussion.

III-I. The logistical support procedures are considered to be similar to those in effect on the U-2.

IIIJ. General security problems were reviewed and there are no outstanding problems except the vast amount of work required to clear required personnel, which would probably reach a peak from January to June 1960, as far as LAC personnel are concerned.

IV A. There are several suggestions I would like to make that have occurred to me since our meeting. The problem of over-all security on this project is much greater than with any other project this contractor has been involved in. I am concerned that in our suppliers' meetings we will have so many groups represented that, even though clearances are provided for all participants, the need to know will not exist for all those present. Would it not be a good idea to schedule certain suppliers at different times through the day, so that, for instance, [REDACTED] would not be fully aware of all the engine problems or the A.R. problems, which

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do not affect their operation at all. Similarly, this would apply to [REDACTED] and certainly there may be cases where LAC is not involved. After an over-all opening of the meeting to cover general problems, it might be a contribution to over-all security if a schedule could be arranged to include only the interested groups in various problems.

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IVB. I have suggested to Col. Burke that we set up flight patterns into and out of [REDACTED] so that visiting aircraft, particularly our own transportation DC-3, would not fly over, or close to, the test pole. I think it would be an easy matter to route the airplanes in and out to the south or southwest, so that there will be a minimum of traffic near the pole.

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IVC. We have been given verbal authorization by [REDACTED] for some items beyond our initial aircraft quote and we would like these to be formalized. There are others which are not authorized, which are outlined below, for which we are requesting authorization.

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1. [REDACTED] for our subcontracting the construction of the large pole. This does not include engineering, which is in our basic contract.

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2. The DC-3 operation, at [REDACTED] per flight hour, to provide for transportation of LAC and other personnel to and from the [REDACTED]

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3. The provision of services of up to four people (at the request of [REDACTED] for material control and accounting at the [REDACTED] until other personnel can be supplied to do this. We currently have two people there, on the assumption that we will be repaid for their services.

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4. Coverage for special services we are asked to render on such things as telephone, TWX, etc. On our previous program, we paid bills for certain parts of your operation, at your request, for security reasons. We assume that the same arrangements would be made for the new commo center, our sterile phones, etc.

5. [REDACTED] base operation personnel to service customer's equipment, re-install shop equipment, and service visiting aircraft. Currently, we have ten people busy re-opening the hangars and other [REDACTED] facilities. The normal operation on

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the U-2 called for three people on a year-round basis.

6. On our previous contract, we were reimbursed for special investigators for our security branch. I assume that we will get similar coverage for this project. This does not include the increased guard service required, which we consider to be a basic part of our operation. 25X1A6a
7. 25X1A1a Separation pay for personnel at [REDACTED] which amounts to [REDACTED], with food and lodging provided. This applies only to personnel who stay over night and not to one day visitors. This, again, follows U-2 practice. It takes the place of the normal field service bonus. We have not had any pressure to raise this amount, due to inflation which has taken place, and we will, of course, resist any increase which our employees may bring up.

VA. I made mention of the desirability of making an ultimate test on a complete half-span wing and nacelle at high temperature. In our basic quote we have included the usual limit load tests on the first aircraft and tests to destruction on miscellaneous elements of the structure. Because of the complex effect of the new materials and high temperatures, it might be advisable to carry out a destruction test on the final configuration to be flown. This test is very expensive. I do not know what such a test would cost, but it would be in the region of 25X1A1a [REDACTED]. We are studying the advisability and feasibility of such a test.

VB. We did not discuss the spares situation on the aircraft. Our conception on spares requirements is different from that which we followed on the U-2. Because of the use of a conventional gear and the over-all configuration of the airplane, as well as the extreme expense of the basic material, we do not plan to construct spare wings, fuselage sections, or large aircraft elements. We would provide spare movable surfaces, landing gears, landing gear doors, and the appropriate purchased equipment, such as valves, boosters, etc. Our current planning figure for spare parts is 25X1A1a [REDACTED]. The distribution should be set up by the usual spares planning group at some later date.

VC. The inertial guidance costs are not included in our quote, as I think you are completely aware.

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25X1A5a2 VD. The cost for construction of the engine augmentors might be transferred from [REDACTED] to LAC. It was originally expected that these would be furnished with the engine, but it now appears that they are more reasonably a part of the basic aircraft. If this is so, we should arrange a transfer of funds after we have arrived at a joint design with [REDACTED]. They are agreeable to this procedure, as stated by [REDACTED] on 3 November. 25X1A5a2

25X1A2g VI. In answer to [REDACTED] 3738, the cost proposal requested in that Headquarters message will be presented in further detail during our next meeting on 16 December. The over-all planning numbers remain as we gave them in our original letter to you, with the exceptions noted above.

Two copies to D. B.
Two copies to J. P.
Enclosures

Kelly